

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Allowed) A system for communicating data protection and control information between a first and a second protective relay operating on respective first and second portions of a power line of an electric power system, each of the first and second protective relays monitoring the electric power system, the system for communicating comprising:

a first communication channel and a second communication channel extending between the first and second protective relays, the first and second communication channels providing bi-directional protection and control information transmission between the first and second relays;

means for applying the protection and control information; and

a switch at each of the first and second relays, the switch having a first position such that the protection and control information from the first communication channel controls, an associated relay output, and the switch having a second position such that the protection and control information from the second communication channel controls the associated relay output, selection of one of either the first position and the second position determined by an indication that one of either the first communication channel and the second communication channel is faulty,

wherein control of the associated relay output is continuous when the switch transitions between the first and second positions.

2. (Allowed) The system of claim 1, wherein the first and second communication channels are substantially identical.

3. (Allowed) The system of claim 1, wherein the first and second communication channels are not identical.

4. (Allowed) The system of claim 1, wherein the protection and control information transmitted on the first and second communication channels undergoes alignment, filtering and logic processing so that the protection and control information is processed identically.

5. (Canceled)

6. (Currently Amended) A first relay for performing current differential protection of a protected apparatus, the current differential protection utilizing a first and a second communication channel transmitting data between a second relay and the first relay, the first and second relays operating on respective portions of a power line of an electrical power system, the first relay comprising:

a local sample circuit configured to generate a local stream in response to receipt of an electrical current signal from a local power line portion;

a first processing circuit operatively coupled to the local sample circuit and the first communication channel, the first processing circuit configured to align, filter and compare the local stream and a first remote stream from the second relay to generate a first ~~binary-trip-decision~~ logic value, and to determine a first channel status based on the first remote stream;

a second processing circuit operatively coupled to the local sample circuit and the second communication channel, the second processing circuit configured to align, filter and compare the local stream and a second remote stream from the second relay to generate a second ~~binary-trip-decision~~ logic value, and to determine a second channel status based on the second remote stream; and

a selection logic circuit operatively coupled to the first and second processing circuits, the selection logic circuit configured to determine a control signal based on the first channel status and the second channel status, the control signal applied to an output contact of the first relay.

7. (Currently Amended) The first relay of claim 6, where the control signal is selectively equivalent to one of the first ~~binary-trip-decision~~ logic value and the second ~~binary-trip-decision~~ logic value based on the first channel status and the second channel status, and wherein continuous current differential protection of the protected apparatus is provided when the control signal is transitioned between the first and second ~~binary-trip-decision~~ logic values.

8. (Previously Presented) The first relay of claim 6, wherein each of the local stream, the first remote stream and the second remote stream comprise respective streams of sampled current values.

9. (Currently Amended) The first relay of claim 6, wherein the first processing circuit comprises:

a first alignment circuit operatively coupled to the first communication channel and the local sample circuit, the first alignment circuit configured to align the local stream and the first remote stream to form a first aligned local stream and a first aligned remote stream, respectively;

a first filter circuit operatively coupled to the first alignment circuit, the first filter circuit configured to remove interfering signal components from the first aligned local stream and the first aligned remote stream to form a first filtered local stream and a first filtered remote stream, respectively;

a first calc compare circuit operatively coupled to the first filter circuit, the first calc compare circuit configured to compare the first filtered local stream with the first filtered remote stream to generate the first ~~binary trip decision~~ logic value; and

a first ping/pong monitor circuit operatively coupled to the first communication channel and configured to determine the first channel status value, the first channel status value indicating a fault level of the first communication channel.

10. (Currently Amended) The first relay of claim 9, wherein the second processing circuit comprises:

a second alignment circuit operatively coupled to the second communication channel and the local sample circuit, the second alignment circuit configured to align the local stream and the second remote stream to form a second aligned local stream and a second aligned remote stream, respectively;

a second filter circuit operatively coupled to the second alignment circuit, the second filter circuit configured to remove interfering signal components from the second aligned stream and the second aligned stream to form a second filtered local stream and a second filtered remote stream, respectively;

a second calc compare circuit operatively coupled to the second filter circuit, the second calc compare circuit configured to compare the second filtered local stream with the second filtered remote stream to generate the second ~~binary trip decision~~ logic value; and

a second ping/pong monitor circuit operatively coupled to the second communication channel and configured to determine the second channel status value, the second channel status value indicating a fault level of the second communication channel.

11. (Previously Presented) The first relay of claim 6, wherein the second relay is configured substantially identically to the first relay.

12. (Currently Amended) The first relay of claim 11, wherein the data is transmitted bi-directionally between the first and second relay, and wherein continuous current differential protection of an apparatus protected by the second relay is provided when a control signal of the second relay is transitioned between the first and second ~~binary trip decision~~ logic values.

13. (Previously Presented) The first relay of claim 6, wherein the first and second communication channels are substantially identical.
14. (Previously Presented) The first relay of claim 6, wherein the first and second communication channels are not identical.
15. (Previously Presented) The first relay of claim 7, wherein the data transmitted between the first and second relays includes protective and control information.